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Antonio A. R. Ioris

Addresses for correspondence:

School of Geosciences
University of Edinburgh
Drummond Street
Edinburgh, UK
EH8 9XP

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"Quien compra diabos, nun puôde bender santos"
[That who buys devils cannot sell saints]
Mirandese adage, from Miranda do Douro

Abstract: The introduction of the Water Framework Directive in Europe represents a unique opportunity to promote more inclusive strategies for the long-term preservation of (socionatural) water systems. However, the analysis of the Portuguese experience, using the River Douro as a case study, reveals still considerable shortcomings in the assessment of problems and the formulation of solutions. Instead of promoting a meaningful dialogue between social groups and spatial areas, there is a systematic attempt to conform to legal requisites by taking a 'techno-bureaucratic' shortcut that largely reproduces the distortions of previous regulatory approaches. Decisions on water management are part of political disputes about regional development and state reform, such as in relation to the provision of water and electricity by public utilities. Nonetheless, those broader issues have been kept tacitly away from the WFD agenda, which so has been concentrated on adjusting established procedures to the (formal) requirements of the new regulation.

Keywords: River Douro, River Duero, WFD, institutional reforms, water charges, political ecology.

1. Introduction

It has been widely observed, both in the academic and non-academic media, that water management is becoming an issue of increasing concern nowadays. The ecological restoration of aquatic systems and the availability of clean, safe drinking water are certainly attracting growing attention from policy-makers, industries, environmental activists and society at large. In that context, this paper seeks to discuss the introduction of the EU Water Framework Directive (WFD) in Portugal, using the River Douro, a very strategic river basin located in the northern part of the Iberian Peninsula, as a case study. WFD has been locally praised by public and private organisations mainly because of its focus away from isolated problems and in favour of catchment approaches and a more efficient use of water. The analysis will outline specific historico-geographical circumstances and their influence on the formulation and implementation of public policies on water use and conservation. Water management reforms will be seen as part of the contested relationship between nature and society and in the perspective of regional development, given that the new procedural mode of water governance under WFD depends on a series of "contextual and contingent" factors operating at the regional scale (cf. Kastens and Newig, 2007). The ongoing experience in the Douro will be reviewed in relation to the broader theories on water management that have underpinned the reform of regulatory institutions in Europe and beyond. The main contribution of the paper is a reflection on the (still) narrow scope of water management institutions, insofar as they have been largely restricted to economic and technocratic aspects of water management, but failed to advance solid basis for democratic decision making and long-term resolution of problems.

It is important to mention that the Douro was carefully chosen for this research because of its unique history and relevant geographical position. The renewed pressures over water stocks (it is projected an increase in water demand by 23% between 2000 and 2020, cf. INAG, 2001), particularly in the form of new dams, additional electric generation and urban water supply, emerge in tandem with growing concerns about environmental disruption and the urgent need to restore freshwater ecology. During the research, water was regularly on the headlines of the mass media and was constantly

mentioned by an ample spectrum of political parties and social groups.[1] It was highly emblematic to watch the Environment Minister coming to the television to announce the construction, until 2020, of ten large hydropower schemes (including six in the Douro) and the expansion of the existing ones (many of those in the Douro).[2] The same minister had recently announced a tender for the selection of private companies to operate, in the form of concession, water supply systems.[3] It was also significant to notice some large energy and construction companies, normally associated with extensive environmental impacts, invoking the Kyoto protocol and the creation of new jobs as an outstanding justification for new hydropower schemes.[4] It was not by chance, thus, that our study coincided with several developments that were fraught with symbolism about the past and the future of water use in the catchment and in the country at large.[5] To be sure, the debate about the management of the River Douro is still in its infancy and is restricted to a small number of stakeholders that gravitate around public agencies and is largely focused on the implementation of WFD. The new Directive is considered the decisive answer to challenging water management problems, given that its regulatory objectives are not chemical or hydrological, as in previous legislations, but are now essentially ecological (Pimenta Machado, CCDR-N officer, pers. commun.).

The new WFD regulation betrays the influence of concepts like 'integrated water resource management' (IWRM), described by Mitchell (2005) as a holistic approach that

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[1] For example, "EDP will explore the Foz Tua dam" [EDP vai explorar barragem de Foz Tua], *Semanário Económico*, 04 Apr 2008.

[2] New dams are included in National Programme of Dams with High Hydroelectric Potential (PNBEPH), published in 2007.

[3] Cf. "Water privatisation will move forward" [Privatização da água vai avançar], *Expresso*, 05 Nov 2007.

[4] Cf. "New dams create seven thousand new jobs and involve two billion euros of investment" [Novas barragens criam sete mil novos empregos e envolvem dois mil milhões de investimento], *Público*, 25 Mar 2008.

[5] The fieldwork research in the Douro took place in March-April of 2008. The main source of information was through semi-structured, in-depth interviews about water use and the implementation of the new water legislation. Respondents included 22 key stakeholders (i.e. 4 regulators/policy-makers, 5 NGO members, 3 consultants/academics and 10 water users [hydropower, public water supply, industry, agriculture and navigation]), who were firstly identified from publications and official documents. Additional names were identified according to a snowball referral strategy. The interviews were followed-up by e-mail and telephone discussions. The observation also involved travelling along the catchment by boat and train, and the attendance of public meetings about regional development. Historical information and secondary hydrological data were systematised and analysed.

is both comprehensive and integrated. However, in different countries the policies based on the IWRM rationale have demonstrated a recurrent difficulty to understand the dynamic, contingent and contestable nature of water use and conservation. Blomquist and Schlager (2005) argue that "[t]he politics of boundary drawing, decision making, and accountability offer important reasons to be sceptical of the prospects for integrated watershed management, at least as some proponents envision it". Our research in the Douro noticed the influence of this international doctrine of water management, but still without enough critical assessments of its shortcomings and repercussions. Crucially it was possible to detect the paradox between the application of science and economics to water management and the difficulty to achieve ecological stability and political equity. This contradiction is persistently hidden behind repeated claims about the soundness of environmental regulation advanced by the new Directive. Even the few voices that question the causes of water management problems still concentrate their criticism on isolated projects, like new dams or utility privatisation, and rarely offer a comprehensive critique of the ideological continuity between old and new paradigms of water regulation.

After the critical assessment of the regulatory procedures being developed for the Douro catchment, it will be ultimately argued that, instead of establishing a genuine new approach to deal with water management problems, the 'new' institutions seem to replicate the old patterns of water development and the uneven decision-making established in the early 20th Century.[6] In order to reveal the gap between changes in discourse and achievements on the ground the text is organised as follows: the next section discusses the political gap in the ongoing water institutional reforms. The essay than provides a brief overview of the evolution of water use and water problems in the Douro. That is followed by a critical scrutiny of the implementation of the Water Framework Directive in the catchment. The text ends with some overall conclusions about the missed opportunities to transform the basis of water use and conservation.

2. The politics of water institutional reforms

[6] Institutions are systems of prevalent social rules that structure social interactions (Hodgson, 2006) and are also complex phenomena, whose reproduction is incomplete, provisional and unstable and that coevolved with a range of other complex emergent phenomena (Jessop, 2001).

Water management is an important item of the contemporary environmental debate, a question that has attracted growing public interest in recent years.[7] It is not difficult to notice that the 'environment' has been more and more popularised, has left its previous clandestine position to become incorporated into everyday discussions. Nonetheless, while there has been an increasing appropriation of the environmental agenda, not just by governments and civic organisations, but also by private companies and large corporations, the political nature of water management is still rarely acknowledged. Water degradation has become the object of uncountable technical reports and extensive media coverage, but little has been said about the political responsibilities for past interventions and the asymmetric opportunities to decide on the management of water systems. For instance, Swyngedouw (1999) already demonstrated that, although the significance of water management has attracted considerable scholarly attention, the "central role of water politics, water culture, and water engineering" in shaping the Iberian society has remained largely unexplored. Differently than the general opinion, water control is at the heart of its management and should be conceived as a process of politically contested use of resources (Mollinga, 2008). In other words, the assessment of water management problems and the respective formulation of solutions are highly politicised issues.

There is in effect a flagrant disconnection between the latest publicisation of water problems and the lack of politicisation, in the sense that questions related to water use and conservation are typically presented to the general public as the merely result of limited investments, inadequate technology or sheer public ignorance. The standard solutions to environmental degradation ignore fundamental questions about the beneficiaries of the exploitation of water systems or the unequal distribution of environmental impacts. The renovation of water management (informed by IWRM or suchlike principles) has been dominated by an emphasis on the so-called 'new institutionalism paradigm' that pays insufficient attention to local human agency and persistently excludes issues of power from the decisions about how to conduct the

[7] Water management comprises multilayered measures carried out by public and private organisations in order to assess, allocate, use and preserve water stocks, aquatic processes and catchment systems. Water regulation includes the set of guidelines, legal instruments and economic incentives used by public organisations to influence social institutions.

reforms (Mollinga, 2001). Mainstream approaches, including scientific methodologies and advertisement campaigns, persistently neglect the complex and intricate processes of local identity and social struggles, expressed through nuanced mechanisms of power mediation (cf. Donahue and Johnston, 1998). In that sense, water remains 'naturalised' (i.e. water problems seem to pertain to an external world, a reality that is not close to people's life) and 'neutralised' (i.e. water problems seem to be unintentional mistakes caused by the lack of technology or legislation).

The biased formulation of the new approaches to water management has been denounced by authors working in the area of political ecology, who criticise the fact that environmental policies remain largely 'apolitical' and maintain only a narrow focus on economic gains and higher operational efficiency (Robbins, 2004). The key contribution of a political ecology approach is the scrutiny of the range of interests involved and the excavation of the "multiplicity of power relationships" associated to water (cf. Swyngedouw, 2004: 75). Political ecology emphasises that social asymmetries are responsible for uneven opportunities and constraints in the access to nature. Numerous studies have confirmed the fundamental connections between environmental degradation and broader issues of production, distribution and consumption of goods, and the circulation of capital. In its initial phase, in the 1970s and 1980s, political ecologists demonstrated the importance of global capitalism on the creation and multiplication of environmental disruption, making use of concepts like dependence theory and class struggle (Bryant, 2001) to explain problems occurring at different geographical scales. In the 1990s, the perceived excess on class issues, which seemed to subordinate the environmental concerns to structural economic rules, was contested by a new group of political ecologists that attempted to refocus the discipline "toward a politicised understanding of environmental explanation beyond the epistemology offered by the [solely] critique of capitalism" (Forsyth, 2003: 07). Under the influence of post-structuralism, the new scholarly phase incorporated important developments in the areas of discourse analysis, feminist studies, state intervention and social construction of science.

This apparent division within the political ecology arena between economic or cultural causes of environmental problems is, in effect, a false dichotomy that sometimes

threatens to split one of the most creative areas of contemporary thought about the environment. Watts and Pett (2004) argue that the post-structuralism contribution can be now taken for granted and the time is ripe for a 'new' moment of political ecology that combines critical theoretical engagements with the practical experience of new movements and civil society organisations. Political ecologists should all share the same interest in the twofold attack on nature and society by the symbolic and material mechanisms of late capitalism and, in particular, the expanding 'neoliberalisation' of nature (cf. Castree, 2008). In the water sector, nature neoliberalisation has resulted in the continuous homogenisation of policies and procedures, violent forms of reaction and multilevel disputes on the control of public policies, which by and large have constrained the achievement of an equitable and effective environmental conservation. Political ecology is well placed to critically study this negative influence of the neoliberalisation of nature in northern and southern countries. As observed by Smith (2007), nature under the influence of capitalism remains constantly 'produced', in the sense that it is exploited and plucked for productive consumption, which in turn alters the form of nature, as a global and systematic ambition. Through an endless process of production, nature becomes a double object of accumulation via a dual strategy of circulation of capital through nature and the circulation of nature through capital. In the case of the Douro, it will be detailed below that the 'production of nature' in the catchment is linked to successive historical phases that retransformed natural features, appropriated common resources and resulted in unequal social and spatial opportunities.

3. Nature production in the Douro catchment

Water management is incorporated in processes happening at different geographical dimensions – from local demands to national development strategies – however the primary scale for the understanding of water management should be the catchment context (Ioris et al., 2006). The catchment, or river basin, is a water circulation system that evolves according to previous circumstances and preceding events, without ever reaching equilibrium, but containing indefinite spatiotime possibilities of change. Instead of fixity in time or in space, the hydrological circulation is accompanied by an

endless movement of matter and organisms in tandem with evolving social demands, practices and discourses. Catchments are the product of multiple trajectories of both society and nature together (cf. Massey, 2005) in permanent interrelation and in constant in transformation (cf. Swyngedouw, 2004). Because of the social and natural interaction, catchment boundaries are constantly transgressed by, for example, the removal or accretion of water, species and people. The very decision to consider or leave out some catchment processes is essentially political and "drawing [watershed] boundaries is a supremely political act" (Blomquist and Schlager, 2005). The catchment is, therefore, more than just a landscape carved by the flow of water from higher points to the mouth, but constitutes "arenas where both water and power circulate" (Molle, 2007).

The multifarious mechanisms of water use and water development in the Douro catchment embodied this dynamic transformation of nature and society. The interrelations between society and nature in the Douro have historically had water as both a 'locus' of change and as a medium for the externalisation of social and environmental transformations. The contemporary geography of the catchment is the direct consequence of a long process of socionatural change that reflects the very construction of Portugal as a nation. The city of Porto, in the mouth of the Douro, was a commercial centre already in medieval time and, since the 15th Century, an important port of the maritime trade maintained by the Portuguese. In the 17th Century (at least since 1651, cf. Cardoso, 2003), wine export to England transformed Porto into the main export centre in the country. The expansion of wine production reflected periods of intense state intervention, followed by liberalisation and again direct government regulation of an industry increasingly dominated by foreign capital (Jacquinet, 2006). Wine was, and still is, produced in the upper catchment, close to the Spanish border, and then transported to the city of Porto where the headquarters of the trading companies were, and still are, located. The River Douro was not only the main means of transportation for the wine produced upstream (until early 20th Century brought downstream using little boats called 'rabelo'), but it was also the main reference for political and economic organisation. The internal movement of commodities and capital in the catchment resulted in an uneven distribution of power between the upper reaches, the production zone, and the lower reaches, the commercial and political centre.

If wine production and fluvial navigation marked the use of water in the 18th and 19th Centuries, heavy engineering became the main focus of government interventions in water management during the 20th Century. The nascent Portuguese Republic, after the crumbling of the monarchy in 1910, passed a new water law in 1919 that reorganised the hydraulic services according to the economic and political goals of the new regime (MAOT, 2002). In the next decades, water became increasingly entangled in sectoral and spatial disputes related to the creation of conditions for economic development and political legitimisation. Water supply to the city of Porto had been since 1882 under the control of a French operator but it was notoriously insufficient and inadequate. The municipal system of Porto was nationalised in 1927 by the dictatorship that emerged from the 1926 coup d'état. In 1934, the same municipal company was given the responsibility of supplying water to neighbouring urban settlements. Despite some localised improvements, in the following decades the water industry in the Douro remained notoriously inefficient and was blamed for recurrent shortcomings (Alves, 2005). It was only in the 1990s, as part of the broader context of government reforms, that a new legislation (Decree 379/1993) was passed to rearrange the legal framework. The new legal regime allowed for greater participation of private companies in the provision of water services; the focus shifted from the exclusive responsibility on the municipal authorities in favour of an 'entrepreneurial' approaches and a semi-privatisation of water supply and sanitation services (Correia, 2000).[8] A regional water utility was formed in 1995 (Águas do Douro e Paiva) to attend not only Porto, but also the surrounding municipalities (water is bought from the regional utility and then provided to customers at subsidised rates by the municipal councils; one of the objectives of the new public policies is to remove this subsidy). The rest of the catchment is mainly served by small, localised water systems (more than 1,400 isolated schemes attend ¼ of the catchment population, cf. INAG, 2001). When compared with the rest of the country, the rate of water supply and sanitation in the Douro remains below the national average:

[8] Part of the same reform process, a new national regulator was established (IRAR) in 1997 specifically to regulate water supply and sanitation. Since then, there have been growing opportunities for the semi-privatisation of public utilities, something that Smith (2004) defines as water 'corporatisation', in that it involves changing public institutional structures to incorporate private sector principles in the provision of services, but making it increasingly less accountable to the public and even to politicians.

only 83% of the population is served by public water supply and 28% is attended by sewage services, against 92% and 42% of the nation as a whole (INAG, 2005).

Among the various sectors that use water, the expansion of hydropower is probably the one that better corresponded to the political aspirations of the 'sister' dictatorships that governed Portugal and Spain during great part of the 20th Century. Particularly after 1950, hydraulic engineering became part of the conservative process of economic development and industrialisation of Portugal, during which the Douro, due to the combination of abundant water and steep slopes, became the 'powerhouse of the country'. Hydropower dams represented the most dramatic form of concentrated developmental intervention, although the dams contributed very little to improve the life conditions of the local populations beyond the short period of construction (Pascoal, 2000). In 1975, the national electricity utility EDP was founded, resulting from the unification of 13 of the 14 existing companies. Those companies had been previously nationalised by the government in order to allow the formation of the large state utility (in the opposite direction, EDP began to be denationalised in 1997, even though in a typical Portuguese fashion the state still maintains strong influence over the privatised company). Especially due to public investments in the 1980s and 1990s, ten large schemes were built in the catchment, which correspond to a total generation capacity of 1,770 MW (or 42.7% of the national total), in addition to 37 small schemes (< 10 MW) that respond for additional 173 MW (INAG, 2005). According to EDP plans, there is a remaining potential for an expansion of another 2,000 MW, but that would obviously take place in the less favourable and more controversial sites (in recent years, the proposals of new Dams in the Douro, such as in the rivers Coa and Sabor, have already attracted fierce criticism from NGOs and local residents).

In more recent times, the relative abundance of freshwater and the unique features of the Douro are once again identified as a strategic asset of regional development. Investments in water management and hydraulic infrastructure became part of an ardent debate about the economic perspectives of the Northern part of Portugal (e.g. CCDR-N, 2006). The fact that the northern region is increasingly relegated to the periphery of Portugal and Europe (Silva Peneda, Member of the European Parliament, pers. commun.)

inevitably creates renewed pressures on the river system.[9] For example, the demand for renewable sources of energy – e.g. hydropower generation – brings the global reaction to climate change and global warming down to the Douro catchment. The reform of the public water services in the Douro catchment, in the form of privatisation or 'corporatisation', constitutes an important element of the modernisation of the national state apparatus according to neoliberal goals.[10] All that makes the Douro a privileged case study of water institutional reforms, due to its insertion into the global economy and the socionatural complexity of water uses in the catchment.

To understand the full extent of the water demands and related management issues, we need a political economy approach to the environment that recognises economic processes and the governance of nature "embedded within, and mediated through, the specific practices and institutional frameworks" of regions and places (Bridge and Jonas, 2002). Despite hydropower and water supply, the economic activity that nowadays consumes the largest volume of water in the Douro is agriculture irrigation, which responds for 114,000 hectares of crop production (INAG, 2005). Most of the irrigation is localised in the lower part of the catchment, benefiting from the best agriculture soils and the proximity to the larger urban centres. The majority of the production employs modern techniques of water management, but a significant proportion of the area of irrigation (around 30,000 ha) still uses traditional gravity irrigation methods with low efficiency (INAG, 2001). In addition, fluvial navigation is again regaining importance as an economic activity, not only for the transport of goods but especially for tourism (172,683 passengers navigated along the 213 km of waterways in 2007, IPMT, 2008), which has the outstanding beauty of the catchment and its natural heritage as the main attractions mentioned by visitors and tourists (Ribeiro, 1998).

Industrial production is another major water user sector and the discharge of effluents into the river system only aggravates the level of pollution caused by the lack of sewage treatment. Water quality is indeed seriously affected by household and industrial effluents, as well as by diffuse pollution from agriculture in Portugal and in Spain. Data

[9] Portugal's economy is in a 'semi-peripheral and intermediary level of development' (cf. Santos, 1993, in Henriques, 2007), in which the state has historically been the main economic player.
[10] "Pre-reforms of the state waiting the 'yes' from the Treasury" [Pré-reformas no estado dependem do 'sim' das finanças], *Diário Económico*, 08 Apr 2008.

from the surveillance system (cf. http://snirh.pt) show no clear trend of water quality improvement in recent years (there is a recovery of Class A, the best water quality condition, but the decline in Classes B, C and D, and a sudden increase in Class E). The sources of water degradation in the Douro are not restricted to pollution but also include the negative influence of dams on native species, sediments and riparian habitats (Cristovão, 1999). Because of the dams in Spain, at the point of entry in Portugal, the river flow is reduced by 27% in an average year of 33% in a dry year. At the mouth of the river, the level of reduction is respectively 17% for an average year and 19% for a wet year, which indicates a recovery capacity in the Portuguese section of the river (INAG, 2001). The water balance is further impacted by evaporation from the artificial reservoirs, representing a loss of water that is equivalent to 9% of the annual water demand in the catchment (INAG, 2001).

4. Old institutions dressed up in new clothes: the 'techno-bureaucratic shortcut'

From the discussion so far, it should become clear that the circumstances of water use in the Douro are the result of complex processes of regional development, spatial transformation and nation building. Through the centuries, the use of water evolved from fluvial navigation and dispersed household demands into hydropower, mechanised irrigation and urban water supply. The more intense manipulation of water predictably resulted in growing negative impacts (e.g. lost river continuity, depleted flows and water pollution), which have unevenly affected different social groups and spatial areas in the catchment. There were some early calls for the reorganisation of water management institutions after the return to democracy in 1974 (Cunha, 1980), but the decisive turn-off was the entrance of Portugal into the European Union in 1986 (Queirós, 2002). After becoming a full EU member, structural changes and rapid economic growth (stimulated by foreign capitals) triggered the review of the then limited environmental regulation. The main piece of water legislation in this period was the 1994 law (Decree 45/1994) that, among other measures, determined the development of the Douro River Basin Plan (published in 2001) with an extensive programme of measures to be implemented through the following eight years. However, in practice, the execution of the Douro plan

failed to address water degradation and water management problems; for the most part it only contributed to the consolidation of previously scattered information about the catchment (Pimenta Machado, CCDR-N officer, pers. commun.). The implementation of the 1994 legislation was nationwide problematic due to the weaknesses of the public agencies, together with the dismantling of the river basin organisations that, although very precarious, existed before (Correia, 2000).

It was only with the approval of WFD in 2000, under the Portuguese presidency of the European Union, that the prospect of more substantial changes seemed to materialise. The Directive was translated into national Portuguese legislation in 2005 (Law 58/2005) and, since then, most local stakeholders passed to identify the opportunity to finally resolve pending and challenging water management problems. WFD introduced significant institutional innovations in Europe, such as integrated river basin management, amalgamation of pollution control strategies, water quantity regulation, water pricing and full cost recovery, and wider public involvement. On the other hand, the implementation of the new regulatory regime has not been without problems. Because of its complexity, normative and informational uncertainties have permeated the reform of the regulatory institutions, but these uncertainties have not been sufficiently and systematically addressed (Newig et al., 2005). Equally, although WFD's approval has been fraught with lobbying and sectoral disputes (Page and Kaika, 2003), the configuration of the new Directive conveys a particular style of assessing problems and formulating solutions that is still notably in favour of top-down measures and apoliticisation (see the critical assessment of Hedelin, 2008). That broader context of political denial and uneven decision-power that underpins the WFD regime has been replicated in the national experience of Portugal, where the engagement with the public has been especially controlled and limited to public hearings and public comments. It has been observed that the decision-making on water policies in Portugal had repeatedly bypassed the formal channels of public representation to operate behind closed doors and away from public scrutiny (Veiga, 2007). In the case of the EIA Directive, for example, participation was simply adopted to conform to the European legal requisites, as can be seen from the flawed design and biased methods of participation then used (Videira et al., 2006). More recently and in relation to WFD, a round of discussions about its

implementation attracted an audience composed of mainly civil servants (60%), of delegates from electricity and water supply utilities (8%), and of private consultants (32%), leaving out the general public, in particular those affected by the water management decisions (cf. INAG, 2007).

Based on the data we gathered in the Douro in 2008, we hypothesise that the implementation of WFD in the catchment has been characterised by two fundamental milestones, namely an increase in the application of science (i.e. the reliance on scientific tools and methodologies for the assessment of problems and formulation of management decisions) and the concentration on the economic dimension of water (i.e. the use and management of water remain subordinate to economic priorities). The crucial problems is that the emphasis on an ever more accurate 'scientific explanation' (as if a perfect management could be achieved with more environmental data and better capacity of data processing), coupled with the insistence that water is a repository of 'financial value' (and, because of that, environmental conservation should follow the same market rationality that gears regional development), have greatly restricted the contribution of the WFD regulation to resolve old and new problems. The limited space where WFD operates in Portugal only allows superficial adjustments in long-established water management procedures, without ever questioning the existence of unequal benefits and uneven liabilities. The attempt to achieve WFD goals without addressing the socionatural complexity of the catchment can be described as a 'techno-bureaucratic' shortcut. The essence of the 'shortcut' is to employ fragmented, non-critical applications of science and economics to old problems that have at least three centuries of history while it ignores the context of water use that was responsible for environmental degradation in the first place.

The first vector of the 'techno-bureaucratic shortcut' – the endless search for the scientific understanding of water systems and the development of patchy managerial approaches – has occupied great part of the agenda of the Portuguese public agencies (in particular, the Institute of Water, INAG), academics and non-governmental organisations.[11] Most of WFD implementation is dedicated to the development of

[11] The technocratic basis of the 'new integrative paradigm' in Europe becomes clear from the funding of research to support the introduction of the new approaches (e.g. during the Fifth Framework Programme, 1998-2002, 30 million euros were spent to fund IWRM related projects,

technical methodologies that try to interpret what 'good ecological status' (the ultimate goal of the WFD regulation) effectively means. Behind public policies and documents, 'good ecological status' is defined as a return to a pristine environment with restored ecological and chemical conditions. The historical and cultural aspects of water use are unceremoniously dropped in favour of simplistic determination of physico-chemical parameters (which are assessed against standardised thresholds, mostly imported from northern Europe). It assumes that, once the impact is quantified, the mechanical application of science and technology (a technical 'quick fix') should be enough to remove the source of impact and re-establish a 'good ecological status'. This extremely linear understanding of the interaction between nature and society follows a unidirectional mental equation that can be represented as:

'quantify degradation + technical fix = impact mitigation (i.e. return to a pristine condition)'

According to this formulation, a 'pristine environment' is equated to a system without human 'interference', as if all social and economic activities had necessarily the same tendency to cause environmental degradation. Such reasoning denies the fact that humans and the environment co-evolved through millennia to form those ecosystems that are now considered to be in 'good ecological condition' (such as in the upper Douro river). By the same token, it ignores the fact that most of the Douro degradation happened because of the intensification of electricity, industry and irrigation promoted in the second half of the 20th Century and to fulfil specific economic goals. In other words, the underlying reasoning is one that abstractly equates human interference with environmental disruption, without sufficiently taking into account the historico-geographic circumstances of local problems and potential management responses.

Environmental regulation obviously needs straightforward approaches to deal with complex systems; moreover, the 'black box' application of science has fundamentally served as a legitimisation tool for the implementation of WFD in Portugal. The mainstream rationality relies on scientific expertise as source of 'truth' that cannot be

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but most of the effort was placed on model development and involved little interaction with stakeholders, cf. Pahl-Wostl, 2007).

questioned, but serves to identify problems and formulate management solutions. In effect, the acceptance of the WFD regulation has been facilitated because of the high level of environmental risks identified in recently commissioned assessments. It is very revealing that the first WFD assessments allocated to the Douro the highest percentage of surface water bodies under substantial environmental pressures (80.5% of the total: 513 out of 638 water bodies) among all the Portuguese river basins (cf. INAG, 2005). It means that even a river with relative abundance of water and a catchment with relatively preserved areas cannot escape the highly technical verdict of WFD. Despite that bleak picture that legitimises the new regulatory approaches with severe assessments, most environmental pressures will be legally allowed to carry on: that can happen under the mechanisms of derogation. Invoking Article 4.7 of the Directive, it is legally possible to grant less stringent environmental objectives to water licence holders on grounds of disproportionate costs or technical unfeasibility. This twisted application of science, on the one hand very rigorous (i.e. alarming technical assessments), on the other, very lenient (i.e. making use of derogations), only reveals the highly politicised and unbalanced basis of the whole WFD regime.

The politicised nature of the assessment of environmental impacts is directly related to the second vector of the 'techno-bureaucratic shortcut', namely the strong reliance on economic instruments of water policy in Portugal. The application of economic goals to water management has occupied the Portuguese water policies for more than a decade, in particular since the 'polluter-pays principle' was incorporated in the 1987 Framework Law on the Environment (Law 10/1987). Water degradation was conceptualised by environmental economists as a form of 'resource scarcity', which creates the material and political conditions for treating water as an economic factor of production. More explicit provisions for cost recovery, revenue raising and efficiency incentives were introduced in the aforementioned 1994 legislation and later confirmed by the 2004 national water plan (INAG, 2004). However, during the pre-WFD period, administrative difficulties and the resistance of some water users prevented the operationalization of the polluter-pays principle. It was only with the translation of the WFD into national law that the adoption of a more explicit economic rationality became

possible, for the reason that the Directive "promotes the concept of water as an economic commodity and the use of economic principles to guide decisions" (Morris, 2007).

During the time of our fieldwork, the final details of the bulk water charges were being discussed to be in place by June 2008 (the charges had been already approved by the Council of Ministers on Mar 2008). The government estimated that the annual revenue will be between €40 and 50 million to be used in water management and environmental restoration.[12] Interestingly, the larger water users – hydropower and public supply in particular – raised little opposition against the introduction of bulk water charges during the negotiation that took place in 2007. As expected, the only sector with major reservations about bulk water charges was agriculture (Fernanda Gomes, planning coordinator, INAG), which is also struggling to cope with the reform of the EU Common Agriculture Policy (CAP) and pressures from the international markets. The hydropower and water supply companies contacted during our research seem to believe that, despite the new financial burden, the new institutional framework operates in their favour, given that it introduces a stable regime of water commodification, legitimatised economic transactions around water and, more importantly, a decision-making system that is amenable to the interests of large operators. Providers of public services of water and electricity can likewise transfer the financial burden to their customers without having to mobilise their own resources.

Maybe because Portugal is a latecomer in the implementation of the polluter-pays principle (when compared with for example Spain, France or England), most of the environmental regulators contacted during our research also demonstrated remarkable enthusiasm for the imminent implementation of bulk water charges. It was possible to perceive a genuine expectation about the advantages of adopting the so-called economic instruments of water management (e.g. charges and financial incentives). Nonetheless, it is still to be proved that the best intentions of regulators and environmental economists in terms of improving water husbandry can be demonstrated in practice. For instance, Martins and Fortunato (2007) studied water supply tariffs in Portugal and identified weak

[12] Cf. "Taxa de Recursos Hídricos entra em vigor em Junho" [Bulk water charges will start in June 2008], *Ambiente OnLine* (www.ambienteonline.pt/noticias/), 07 Mar 2008. The amount to be obtained from water charges represents around 10% of the annual demand for investment between 2001-2020, as described in the 2004 National Water Plan.

price elasticity (i.e. little response to higher charges). Given the current level of charges, it is unlikely that the it can provide enough incentives to change consumer behaviour (in the Douro, it is calculated that the transference of bulk water charges for domestic consumers will represent an increase of only 5% in the current bill of average households, or additional € 0.0156/m^3 cf. Joana Boaventura, Águas do Douro e Paiva, pers. commun.). If it is true that the polluter-pays principle can help to identify responsibilities for environmental damage (Liodakis, 2000), the claim that an optimal economic solution would naturally follow from the adoption of water charges (cf. Chong and Sunding, 2006) only exposes the technocratic basis of the WFD regime. The narrow scientific and economic pillars of the WFD regime directly reflect a combination of hegemonic rationality and commodity fetishism, a recipe that in other countries has generated multiple social inequalities (cf. Loftus, 2006).

The 'techno-bureaucratic' shortcut that shapes water reforms in Portugal is also increasingly present on the other side of the Douro catchment, beyond the Spanish border. Technical assessments identified 98,000 hectares of irrigated land suffering from water deficit in Spain (out of the 550,000 hectares under irrigation in the Spanish section of the Douro), which nonetheless was not enough to prevent the preparation of a plan to increase the area of production by another 306,475 hectares and the related expansion of water infrastructure (Confederación Hidrográfica del Duero, 1994). Bakker (2002) had observed that droughts in Spain in the mid-1990s facilitated discursive depictions of water as increasingly scarce, which served as additional justification for the long-held vision of large-scale resource development and interbasin transfer projects. The constant attempt to find quick fix solutions – the essence of the techno-bureaucratic shortcut – was particularly evident in the plans to transfer water from the Tejo to the Douro that emerged in Spain in the 1990s. Similar ideas were put forward during the 2008 drought in the form of a proposal to transfer water from the Ebro to the city of Barcelona, which means that in the future that Douro can be again remembered as a reserve of water to other regions. The techno-bureaucratic intensification of water use on the two sides of the border cannot avoid the crude conclusion that "it is not clear that the Douro can bear the ambitious water management plans of both countries" (Dominguez et al. 2004).

5. Discussion and conclusions: The past encroaches upon the future

This brief overview of the local experience of water institutional reforms in the Douro demonstrates the inherent contradiction between the formal objectives of recent water policies and the procedures actually adopted on the ground. The process of institutional reforms started in the 1990s with changes in the legislation and increasing calls for an integrated management, but it was really the opportunity created by WFD that provided the political momentum for more ambitious reforms. The narrow focus on engineering constructions that marked water management between 1950s-1990s was then replaced by more subtle attempts to regulate water through ecological assessment and economic instruments. Although there was a shift from single procedures to multilevel integrated approaches (e.g. INAG, 2001; 2005), it is also possible to detect a clear line of continuity between past and present. If the WFD regime helps to draw attention to water problems and mobilises private and public resources, at the same time it unravels silent conflicts, creates competition (e.g. sites for hydropower) and domesticates public participation. Water management continues to be a highly politicised matter, but that is largely omitted in most public documents and academic assessments. Underneath the new regulatory instruments, there is a constant reaffirmation of a centralised and selective basis of dealing with water management questions. A rationalistic approach to water problems – epitomised here in the expression 'techno-bureaucratic shortcut' – has pervaded most of the ongoing reforms. Using the terminology of critical realism, it can be concluded that the relation between the WFD regime and the techno-bureaucratic rationality is not only contingent, but necessary.

The overall result has been a considerable self-cancellation of the ambitious goals of WFD in the Douro, due to the narrow understanding of water problems and potential solutions. That is consistent with the findings of Hedelin (2008) that the Directive has facilitated integration and raised public participation, but has also failed to handle power asymmetries, foster collective learning and avoid that different ideological orientations are suppressed. Similar assessments of the initial stages of WFD implementation, in another European country, show that policy learning through participation appears significantly limited due to the pattern of interest group power (Flynn and Kröger, 2003).

It seems that the socionatural complexity of catchment dynamics is still systematically neglected in favour of top-down, prearranged management responses. There has been indeed scarce room for alternative ways of thinking about water management problems, let alone the formulating solutions that are less intensive in capital and less dependent on imported technologies. So far, the renovation of social institutions has only dealt with the consequences, but not the causes of socionatural problems, namely the subordination of social and environmental demands to the economic and political priorities of an increasing neoliberalisation of nature. The discourse of official publications and the mass media conceals who is telling the storylines of the Douro, what the involved interests are and how political asymmetries have influenced the decisions. For all those reasons, what is really required is a decisive break with traditional mechanisms of water control, not its generalisation. What is needed is a genuinely innovative way of dealing with water problems, one that addresses the uneven balance of power between spatial areas and social groups, as well as incorporates traditional wisdom and the contribution of local communities in the development of creative solutions to old and new water management challenges. Unless social differences and the reproduction of social inequalities are addressed, the causes of water management problems will remain unchanged.

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References

Alves JF. 2005. *Águas do Douro e Paiva S.A. Dez Anos 1995-2005*. Águas do Douro e Paiva: Porto.

Bakker K. 2002. From state to market?: water *mercantilización* in Spain. *Environment and Planning A* **34**: 767-790.

Blomquist W, Schlager E. 2005. Political pitfalls of integrated watershed management. *Society & Natural Resources* **18**(2): 101-117. DOI: 10.1080/08941920590894435

Bridge G, Jonas A. 2002. Governing nature: the reregulation of resource access, production, and consumption. *Environment and Planning A* **34**: 759-766.

Bryant RL. 2001. Political ecology: a critical agenda for change? In *Social Nature: Theory, Practice and Politics*, Castree N, Braun B (eds). Blackwell: Oxford. pp151-169.

Cardoso AB. 2003. *Baco & Hermes. O Porto e o Comércio Interno e Externo dos Vinhos do Douro (1700-1756)*. GEHVID: Porto.

Castree N. 2008. Neoliberalising nature: the logics of deregulation and reregulation. *Environment and Planning A* **40**: 131-152. DOI:10.1068/a3999

CCDR-N. 2006. *Norte 2015 - Competitividade e Desenvolvimento: Uma Visão Estratégica*. CCDR-N.

Chong H, Sunding D. 2006. Water markets and trading. *Annual Review of Environment and Resources* **31**: 239-264.

Confederación Hidrográfica del Duero. 1994. *Plan Hidrológico – Propuesta del Plan. Anejo 4 – Relación de Mejoras de Regadio y de Nuevas Transformaciones*. Ministerio de Obras Públicas, Transportes y Medio Ambiente.

Correia FN. 2000. Water resources management in Portugal: an overview based on the EUROWATER country report. In *Water Resource Management: Brazilian and European Trends and Approaches*, Canali GV, Correia FN, Lobato F, Machado ES (eds). ABRH: Porto Alegre, Brazil. pp121-154.

Cristovão A. 1999. Para a valorização dos recursos naturais do vale do Douro. *Douro Estudos e Documentos* **IV**(8): 19-31.

Cunha LV. 1980. Para quando um plano nacional de recursos hídricos em Portugal. *Recursos Hídricos* **1**(2): 35-43.

Dominguez D, Manser R, Ort C. 2004. *No Problems on Río Duero (Spain) – Rio Douro (Portugal)? The Science and Politics of International Freshwater Management*. ETH: Zurich.

Donahue JM, Johnston BR. 1998. *Water, Culture and Power: Local Struggles in a Global Context*. Island Press: Washington, D.C.

Flynn B, Kröger L. 2003. Can policy learning really improve implementation? Evidence from Irish responses to the Water Framework Directive. *European Environment* **13**: 150-163. DOI: 10.1002/eet.320

Forsyth T. 2003. *Critical Political Ecology*. Routledge: London and New York.

European Environment

Hedelin B. 2008. Criteria for the Assessment of Processes for Sustainable River Basin Management and their Congruence with the EU Water Framework Directive. *European Environment* **18**: 228-242. DOI: 10.1002/eet.481

Henriques JM. 2007. Globalização, "desintegração local" e governança: discursos e possibilidades. In *Inovação e Globalização: Estratégias para o Desenvolvimento Económico e Territorial*, Lança IS, Rodrigues W, Mendonça S (eds). Campo das Letras: Porto. pp145-165.

Hodgson GM. 2006. What are institutions? *Journal of Economic Issues* **40**(1): 1-25.

INAG. 2001. *Plano de Bacia Hidrográfica do Rio Douro – Relatório Final*. Ministério do Ambiente e do Ordenamento do Território: Lisbon.

INAG. 2004. *Economia da Água do Plano Nacional da Água*. INAG: Lisbon.

INAG. 2005. *Relatório Síntese sobre a Caracterização das Regiões Hidrográficas Prevista na Directiva-Quadro da Água*. Instituto da Água – Ministério do Ambiente, do Ordenamento do Território e do Desenvolvimento Regional: Lisbon.

INAG. 2007. *Avaliação do Processo de Participação Pública do Calendário e Programa de Trabalhos para Elaboração dos Planos de Gestão de Região Hidrográfica*. INAG and APRH: Lisbon.

Ioris AAR, Hunter C, Walker S. 2006. A framework of indicators to assess the sustainability of freshwater systems. *Physical Geography* **27**(5): 396-410.

IPMT. 2008. *Via Navegável do Douro: Actividades em 2007*. Instituto Portuário e dos Transportes Marítimos, Delegação do Norte e Douro: Peso da Régua.

Jacquinet M. 2006. Evolução dos regimes de regulação no sector do vinho do porto (1756-1945). In *O Douro Contemporâneo*, Pereira GM, Leal PM (eds.). GEHVID: Porto. pp11-28.

Jessop B. 2001. Institutional re(turns) and the strategic-relational approach. *Environment and Planning A* **33**: 1213-1235.

Kastens B, Newig J. 2007. The Water Framework Directive and agricultural nitrate pollution: will great expectations in Brussels be dashed in Lower Saxony? *European Environment* **17**: 231-246. DOI: 10.1002/eet.446

Liodakis G. 2000. Environmental implications of international trade and uneven development: toward a critique of environmental economics. *Review of Radical Political Economics* **32**(1): 40-79.

Loftus A. 2006. Reification and the dictatorship of the water meter. *Antipode* **38**(5): 1023-1045.

MAOT. 2002. *Plano Nacional da Água – Volumes I e II*. Ministério do Ambiente e Ordenamento do Território: Lisbon.

Martins R, Fortunato A. 2007. Residential water demand under block rates: a Portuguese case study. *Water Policy* **9**: 217-230.

Massey D. 2005. *For space*. SAGE: London.

Mitchell B. 2005. Integrated water resource management, institutional arrangements, and land-use planning. *Environment and Planning* A **37**: 1335-1352.

Molle F. 2007. Scales and power in river basin management: the Chao Phraya River in Thailand. *The Geographical Journal* **173**(4): 358-373.

Mollinga PP. 2001. Water and politics: levels, rational choice and South Indian Canal Irrigation. *Futures* **33**: 733-752.

Mollinga PP. 2008. Water, politics and development: framing a political sociology of water resources management. *Water Alternatives* **1**(1): 7-23.

Morris J. 2007. Water policy, economics and the EU Water Framework Directive. In *The SAGE Handbook of Environment and Society*, Pretty J et al. (eds). SAGE: London. pp191-205.

Newig J, Pahl-Wostl C, Sigel K. 2005. The role of public participation in managing uncertainty in the implementation of the Water Framework Directive. *European Environment* **15**: 333-343. DOI: 10.1002/eet.398

Page B, Kaika M. 2003. The EU Water Framework Directive: part 2. Policy innovation and the shifting choreography of governance. *European Environment* **13**: 328-343. DOI: 10.1002/eet.331

Pahl-Wostl C. 2007. The implications of complexity for integrated resources management. *Environmental Modelling & Software* **22**: 561-569.

Pascoal JE. 2000. *O Douro Internacional: A Permeabilidade de uma Fronteira Natural (1900-1986)*. MSc Dissertation in Geography. FLUP: Porto.

Queirós M. 2002. O ambiente nas políticas públicas em Portugal. *Finisterra* **XXXVII**(73), 33-59.

Ribeiro M. 1998. Turismo rural e desenvolvimento na região do Douro – processos e (alguns) resultados da evolução recente do sector. *Douro Estudos e Documentos* **III**(6), 25-49.

Robbins P. 2004. *Political Ecology*. Blackwell Publishing: Oxford.

Smith L. 2004. The murky waters of the second wave of neoliberalism: corporatization as a service delivery model in Cape Town. *Geoforum* **35**: 375-393.

Smith N. 2007. Nature as accumulation strategy. In *Socialist Register: Coming to Terms with Nature*, Panitch L, Leys C (eds). Merlin Press: London. pp16-36.

Swyngedouw E. 1999. Modernity and hybridity: nature, regeneracionismo, and the production of the Spanish waterscape, 1890-1930. *Annals of the American Association of Geographers* **89**(3): 443-465.

Swyngedouw E. 2004. *Social Power and the Urbanization of Water: Flows of Power*. Oxford Geographical and Environmental Studies. Oxford.

Veiga BGA. 2007. *Participação Social e Políticas Públicas de Gestão de Águas: Olhares sobre as Experiências do Brasil, Portugal e França*. PhD Thesis, University of Brasília, Brazil.

Videira N, Antunes P, Santos R, Lobo G. 2006. Public and stakeholder participation in European water policy: a critical review of project evaluation processes. *European Environment* **16**: 19-31. DOI: 10.1002/eet.401

Watts M, Pett R. 2004. Liberating political ecology. In *Liberation Ecologies: Environment, Development, Social Movements*, Peet R, Watts M (eds), 2nd Edition. Routledge: Abingdon. pp3-47.